

## Model WDW-20 Computer Control Electromechanical Universal Testing Machine



### Applications & Characters:

WDW-20 computer control electromechanical universal testing system is designed according to ASTM, ISO, DIN, EN etc. standards. It is computer-controlled precision testing machine, suitable for extensive metallic & nonmetallic materials for tension, compression, bending, shearing and low cycle test etc. It features as high precision, high stability as well as high reliability. Equipped with PC system & printer, graph, test result display, data processing and printing can be done easily. Complete with modulus for metal, spring, textile, rubber, plastic and other material testing. It is widely used in many fields of such as industry factories, research & development, test institutes and training centers etc.

It adopts rigid load frames, high accurate load weighting system, advanced PCI measuring & control system and intuitive modular application software. Configured with extensive range of accessories for various applications, it can provide the optimal testing solutions for your individual application needs. With abundant experience of 20 years of involvements in materials testing industry & application knowledge on all kinds of sectors, TE is capable of configuring the exactly suitable solutions & more accurately test system to customer involving the choice of load frame, core measuring & control elements, software package, grip/fixture etc based on their specified test application and requirements.

### Applied Standards:

Load meets or exceeds the following standards: ASTM E4, ISO7500-1, EN 10002-2, BS1610, DIN 51221.

Strain measurement meets or exceeds the following standards: ASTM E83, ISO 9513, BS 3846, EN 10002-4.

Safety: This machine shall conform to all relevant European CE Health and Safety Directives EN 50081-1, 580081-1, 73/23/EEC, EN 61010-1

### Load Frame:

The frames all incorporate human factor considerations in the design to ensure safety, reduce operator fatigue, and provide the highest level of flexibility. Extremely robust crosshead guidance is incorporated in all frame designs providing the highest level of lateral crosshead stiffness.

**Load cell** is with high accuracy interchangeable for all frames allowing each frame to operate full capacity.

**High accuracy:** The preloaded precision ball-screw with high speed low noise ensures high speed and position measurement accuracy and less noise.

**High stiffness:** The load frame is with 4 columns and heavy duty pre-loaded bearings.

**Safety features:** The testing machine stops automatically when the change in the test force exceeds a specified value during operations.

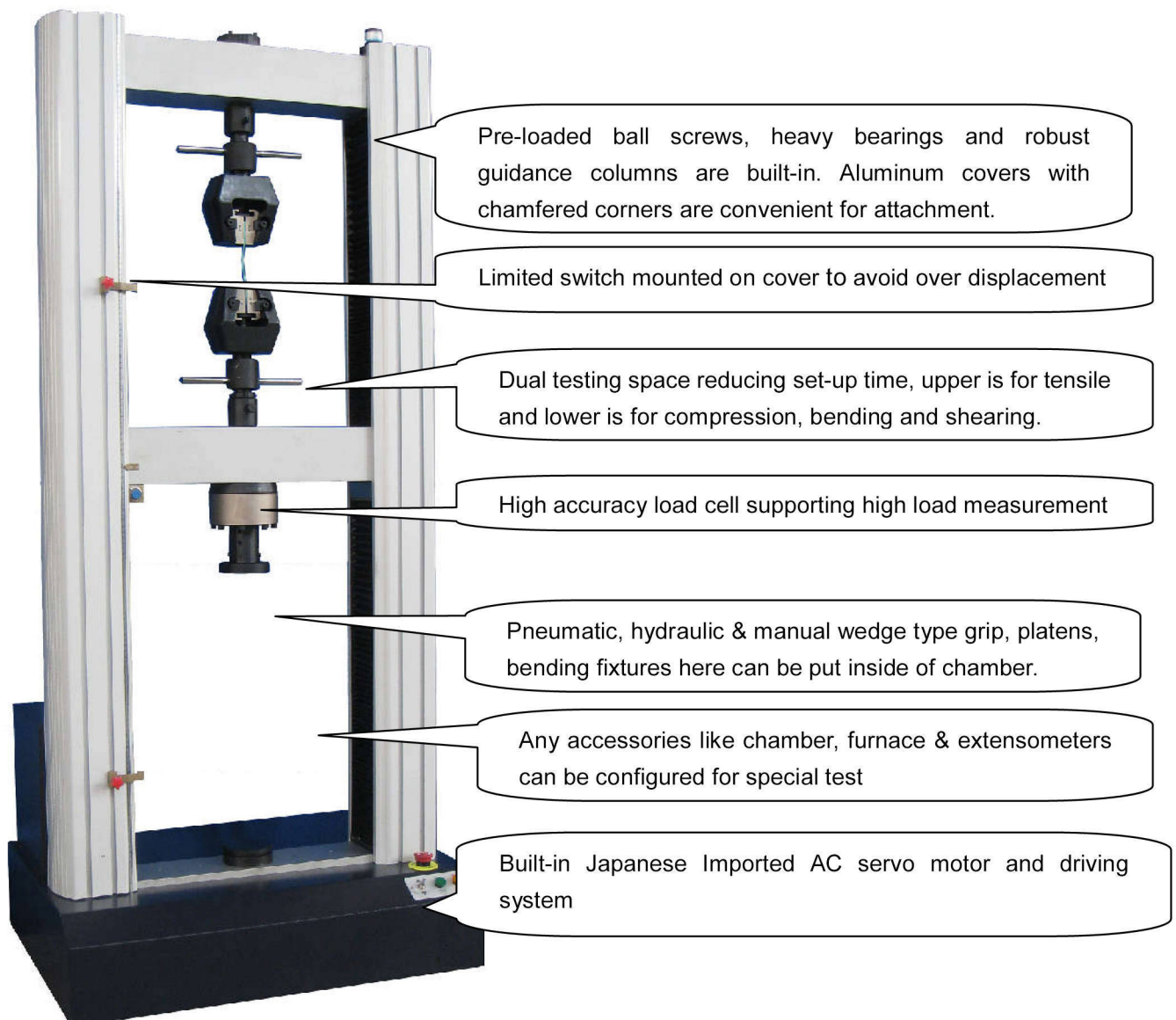
**Large space in the working area:** The insides of columns provide wide space for the operator.

**Over-stroke limiter:** The range of the crosshead movement mechanically limited.

### Comfortable working area

The wide legroom under the load unit provides a comfortable working area for attaching and removing jigs.

### Load Frame:





### Loading weight system (20kN):

Loading weight system is the most critical aspect of mechanical testing.

has accumulated great experience in selection of superior core loading weight system in terms of materials, design, construction technology and especially performance & accuracy. Cooperating with top-quality manufacturer of load cell, made a special customs design so that it can be optimized match with measuring & control system for most accurate test results.

With advanced PCIE measuring control card, the readability can be from 0.4%(optional is 0.2%) to 100% of the rated capacity, Calibration within 0.5% accuracy can be carried out as per ASTM E4, ISO7500-1, EN 10002-2, BS1610, DIN 51221 standards.

This special load cell provides excellent immunity to impact and side forces, rugged & low-profile measuring body with strictly symmetrical design is optimally suited to ensure high endurance strength. Excellent linearity guarantees highly precise measurement, additional mechanical protection of the strain gage area. It can be set for protections of 105% over range protection, over load capacity of 150% without permanent zero shift and over load projection of 300% of the rated capacity without mechanical damage. This meets the stringent Weights and Measures requirements throughout Europe and the USA.



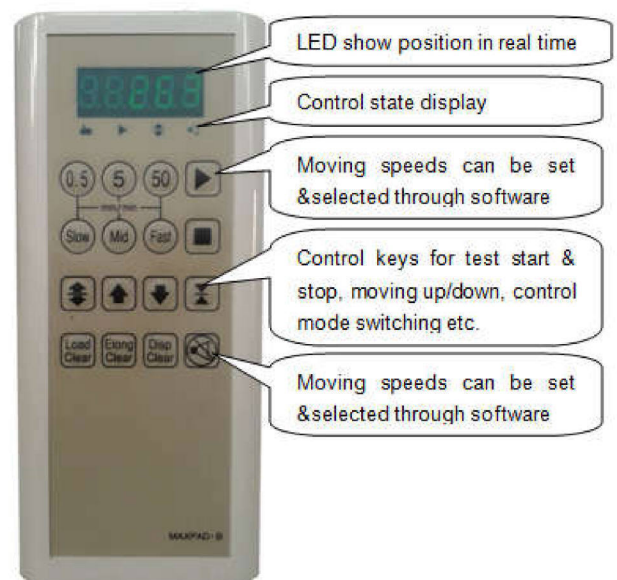
### Electronics and Control Part:

Self-developed & most advanced PCIE measuring & control card for testing machine has functions of real time data collection, communication, measuring and control etc. according to related ASTM, ISO standards. It can be inserted in the PCIE slot of computer and connected with testing machine by data cable, then above functions can be realized easily. Effective sampling rate can be up to 50Hz, in addition, the different versions for sampling rate of 200Hz, 500Hz and higher are available as options to meet special test requirements. Besides applying for static tests, such card with related configuration is also able to be utilized for low cycle & other basic fatigue tests.



### Handheld control unit

Maxpad handheld control unit is magnetically attached to the load frame to provide crosshead moving control through in three adjustable speeds for easier operation when install/dismantle the specimen, LED screen shows the position in real time and functional keys for test start & stop, moving crosshead up & down, control mode switching, clear zero etc.



### Patent technology of TE (optional):

**Electrical Calibration Modulus:** Calibration of strain gauged load cell and extensometer by Electrical way and provide you a quick & convenient way. No necessary to calibrate the load cell and extensometer by traditional calibrators. Do the calibration whenever you need.



### Main Specification

- Load capacity: 20kN
- Load measuring range: 0.4%~100% of rated capacity
- Load accuracy: Class 0.5
- Load resolution: 1/500,000FS
- Position resolution: 0.025μm
- Position accuracy: ±0.02mm or 0.5% of displacement (whichever is greater)
- Crosshead speed range: 0.001-500mm/min
- Crosshead speed accuracy: ±0.5% of set speed (zero or constant load)
- Total Crosshead Travel: 1180mm
- Space between columns: 420 mm
- Twin ball screw driven with close-loop and servo motor control.
- Power supply: 220VAC, 1 phase, 50Hz/110V, 1 phase, 60Hz
- Overall dimension: 780x500x1737mm
- Weight: 140kg

### Standard Accessories:

- Wedge type self-locking tensile test fixture

Grip jaws for flat specimen: 0-7mm, 7-14mm

1 set each

Grips jaws for round specimen: Φ4-Φ9, Φ9-Φ14mm

1 set each

Width & height of grip jaws: 35x55mm



- Compression platen:

1 set

Platen: dia.100mm





- Computer & software 1 set

Computer: Dell, with the following configuration: Dell, Intel Pentium G3250 Dual-core (2 Core) 3.20 GHz, 3MB processor, 2GB, DDR3 1600MHz, SATA 7200RPM, HD 500G, 16X DVD-ROM Drive, Windows 8.1 basic system 64bit with license; 19inch screen LED monitor, photoelectrical mouse, and multiple keyboard;  
Software: **English & Russian** Version (For details, please refer **Annex-1**)



- Servo Control system 1 set

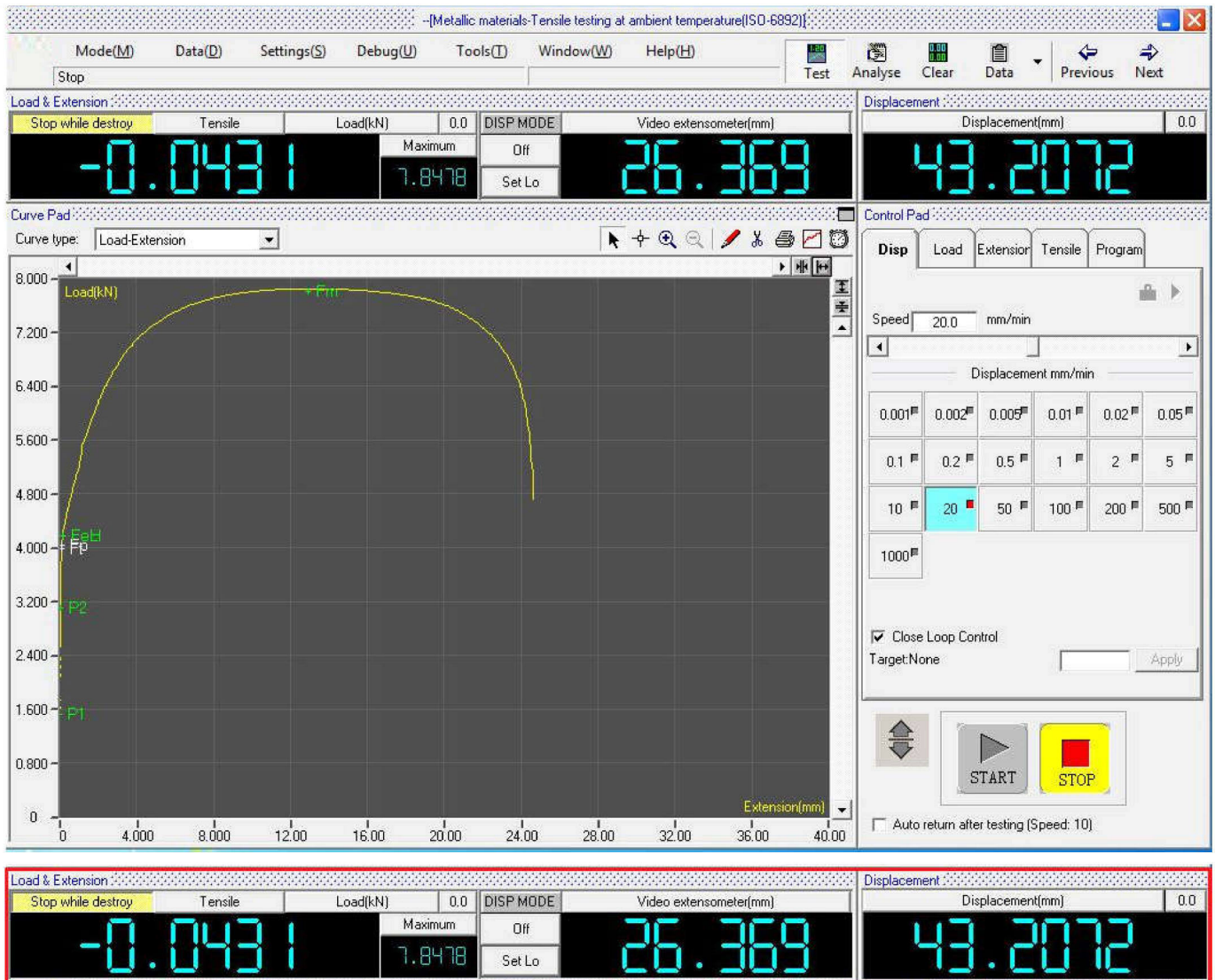


## Annex-1

### Features of

### Measuring & Control software

Maxtest software refers to the software characteristics of the top manufacturers of testing machine in the world and proposals of various testing requirements from the end users, and combines all the advantages of former versions of software with lots of new features. Optimized software structure makes the testing operation easy, convenient and powerful. Main interface as following,



5-digit display for load, peak value and displacement values at least, 4-digit display for extension value at least;

#### Features:

1. Full digital control

The whole measuring and control system adopts the special controller, which can achieve the digital adjustment of zero point and gain of load, deformation and displacement, and it's easy to operate and possesses the high reliability.

2. Possess the functions of storage, setting and loading for various kinds of parameters, which make it convenient to connect multiple transducers with one load frame.

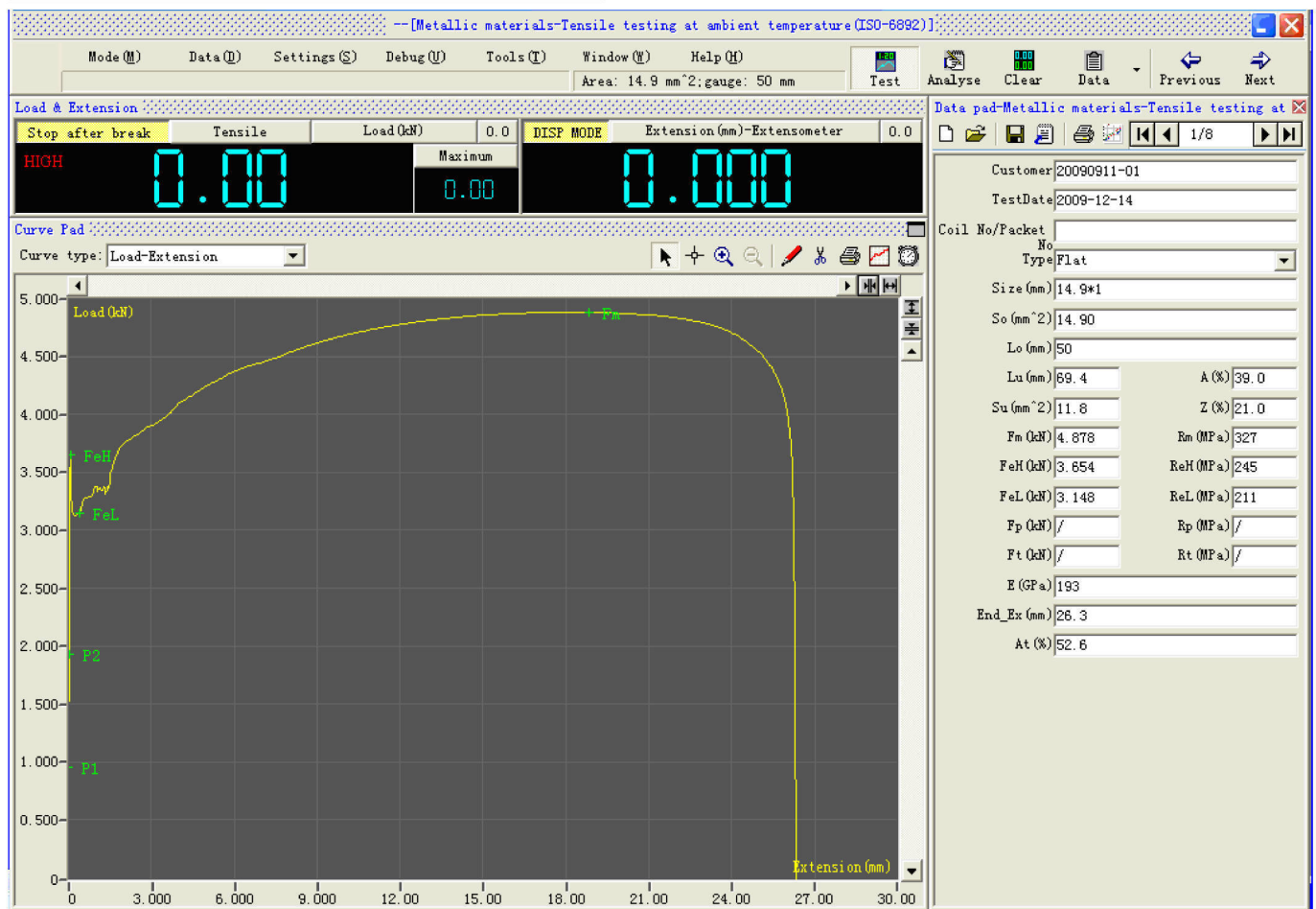
3. Realize the close-loop control, and show the reference curve during the executive operator adjusting the close-loop parameters, so the user can observe the close-loop effect caused by the parameters.

4. Perfect intelligent expert system of control mode to offer the automatic programming function. The user can set control mode during the test or each step of the test as the regulation according to the user's actual needs to compile the program, which can meet the test requests of various kinds of materials and test standards at home and abroad.

5. Perfect graphic function to complete the functions of the reappearance, amplification, reduction, self-adaptation, lapping of the curves, display and print the curve at the appointed range, observe the coordinate of the test point.

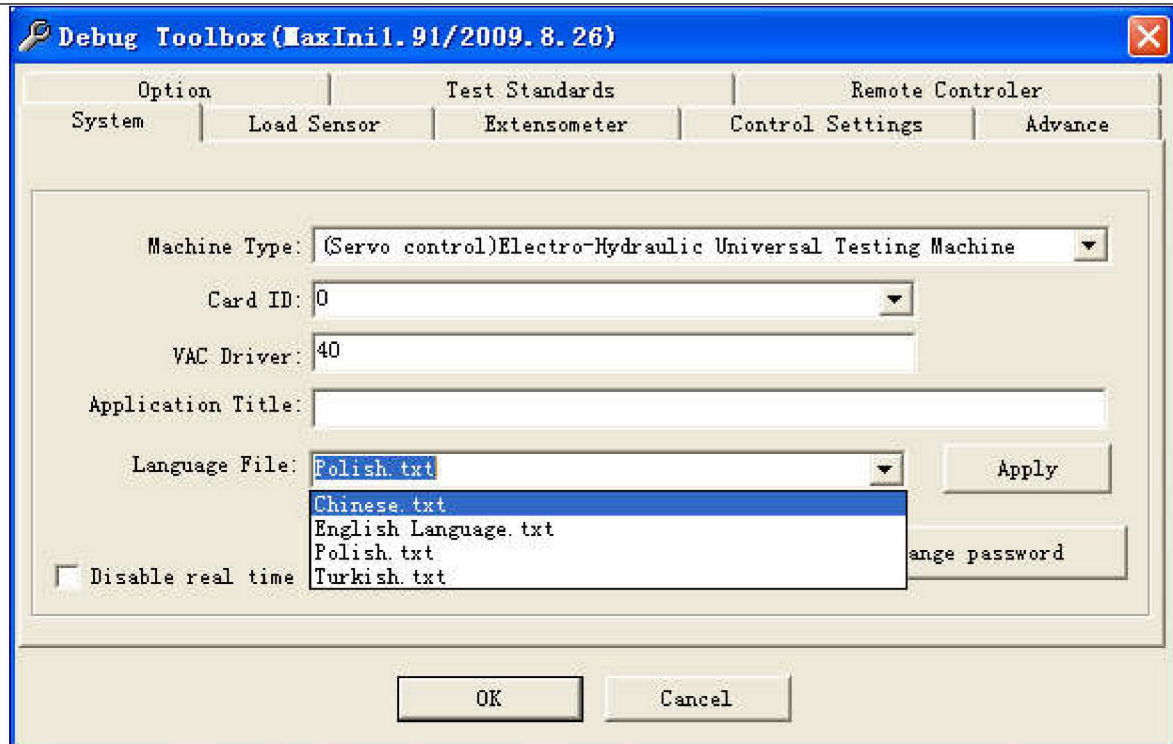
6. Data processing supports automatic analysis and graphic man-machine mutual processing, which is convenient to check and compare the test results.
  7. The user can self-define the output of the test reports, which has the utmost flexibility.
  8. Perform the automatic inspection of the operation system,; real-time acquisition and control under the platform of Win2000、WinXP, etc. NT mode; accurate timing and high-speed sampling;
  9. Multilevel identity management integrates the flexible function of the testing machine with easy operation, which not only makes the operation easy by ordinary operator but also protect the system effectively.
  10. Framework type design concept and open type program structure make it easy to extend the function of the machine and further exploitation for the user. It can also connect externally internet program module to complete the requests of data connecting internet.
  11. Based on the database, test data is stored by form of text file, which is convenient for the user to inquire about and utilize the various kinds of commercial report forms to reprocess the test data, meanwhile transfer the data to the internet conveniently.
  12. Multilevel identity management
- Multilevel identity management, different identity has different functions, which not only makes the operation quick by ordinary operator, but also protect the system effectively.

**Please see more information with some pictures:**



The control modes, test data and curves can be displayed in real time in the main interface and can be shifted at any time.

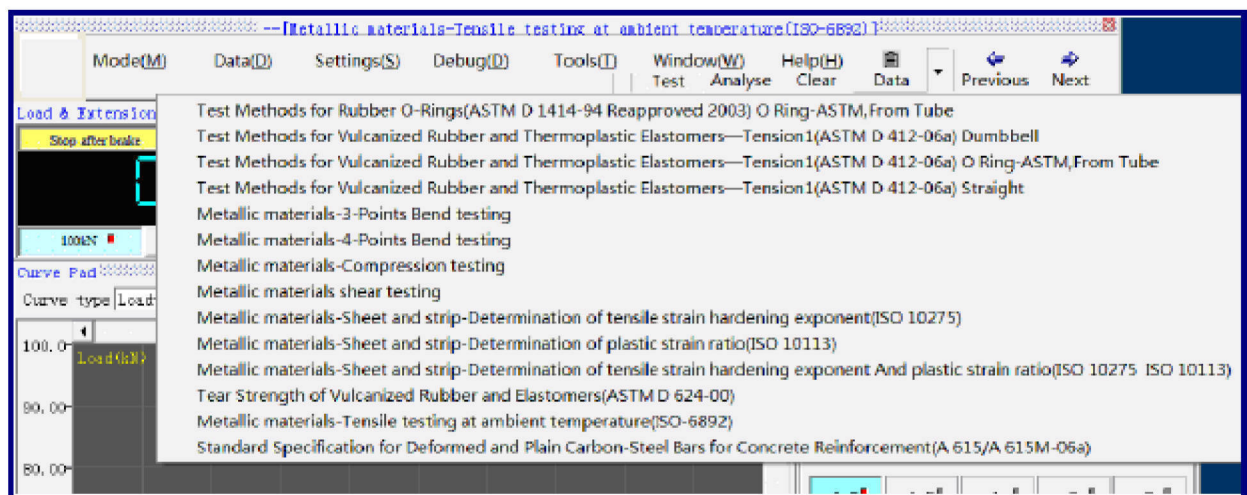




The deep-seated parameters of software are contained in Debug Toolbox

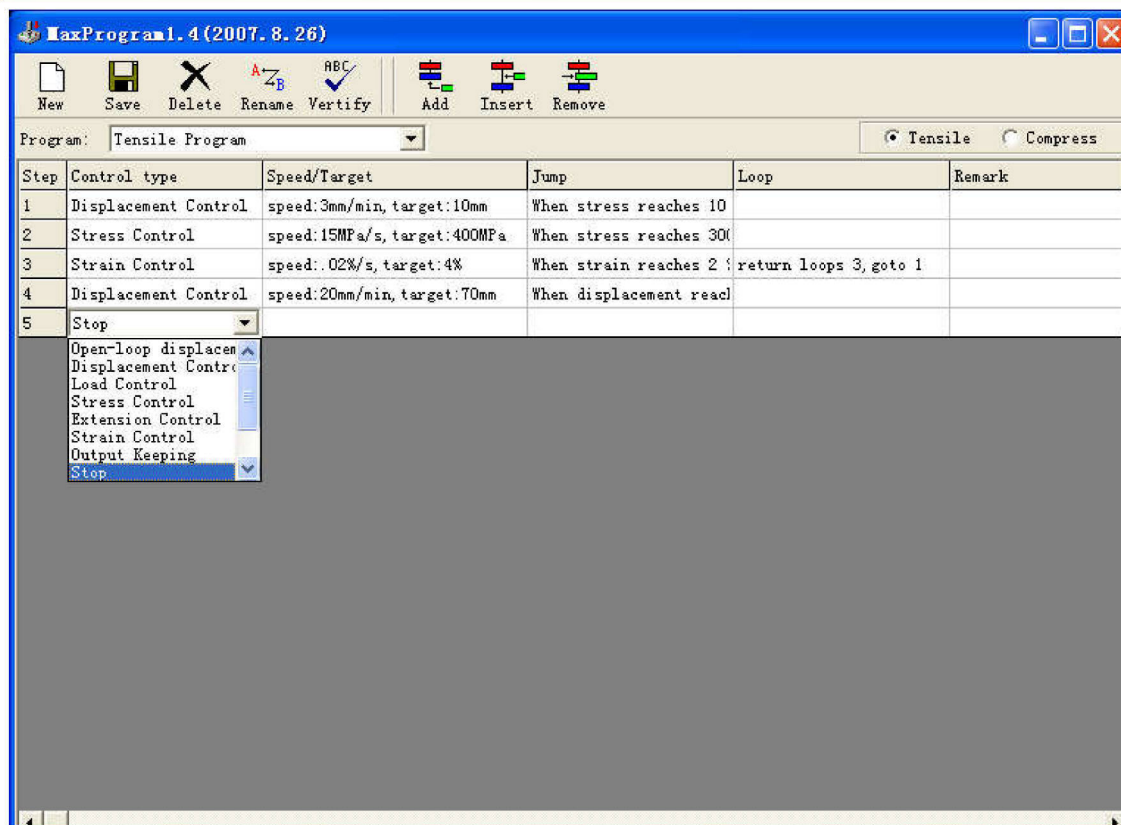
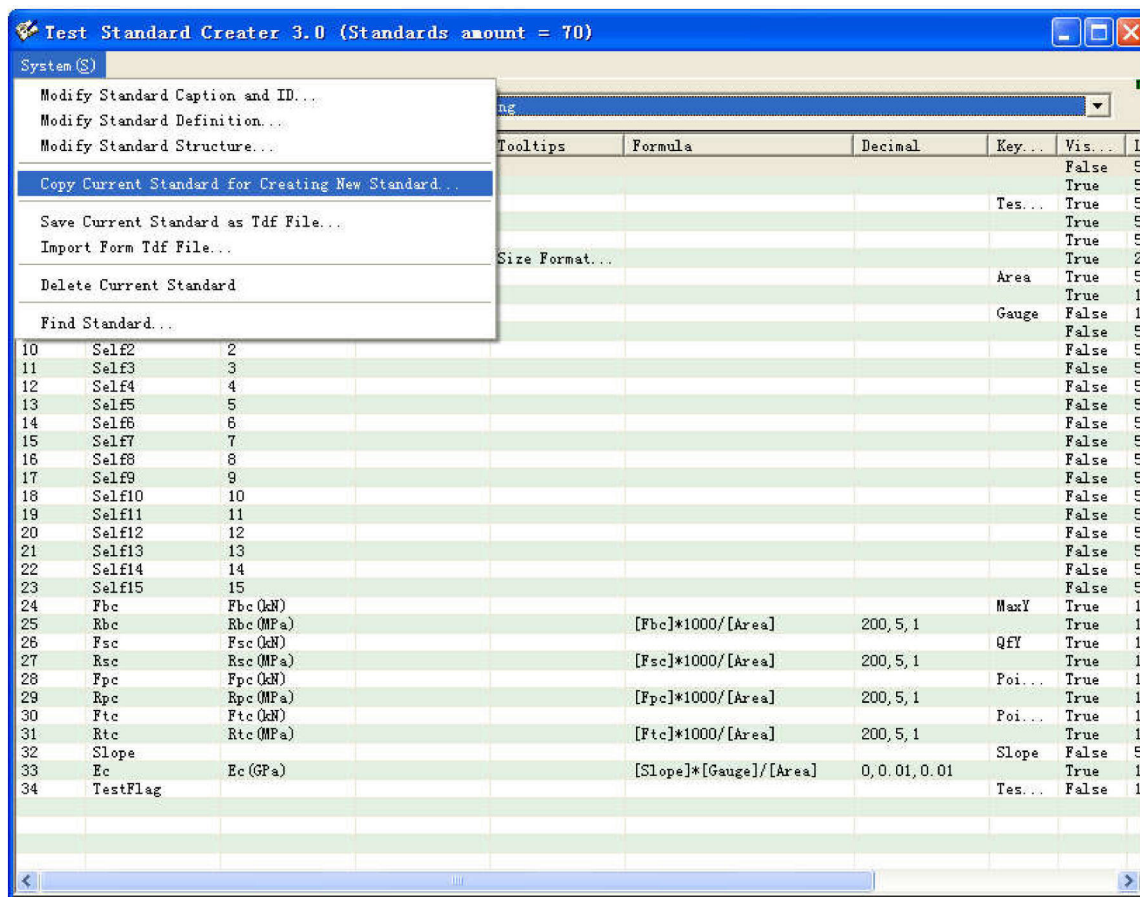
Multi-language function:

With the flexible language edited function, it can support multi-language such as English, Chinese etc. and you can translate the software language into the native language by yourself.



Software supports all kinds of popular testing standards i.e. ISO, ASTM, BS EN, DIN, JIS, GB etc.

Users can modify and add own testing standards and methods.



MaxProgram Editor possesses of multiple full digital control modes, i.e Displacement control, Stress (Load) control, Strain (Deformation) control, Low cycle control. User can edit the most complex and logical procedure by MaxProgram Editor. The combination of above functions can meet all kinds of routine test purpose.

Control Pad

Disp
Load
Extensior
Tensile
Program

Speed
20.0
mm/min

Displacement mm/min

0.001	0.002	0.005	0.01	0.02	0.05
0.1	0.2	0.5	1	2	5
10	20	50	100	200	500
1000					

Tighten speed
Target:None
Apply

Control Pad

Disp
Load
Extensior
Tensile
Program

Speed
0.0200
(kN/s)
0.200
(MPa/s)

Load(kN/s)

0.02	0.05	0.1	0.2	0.5
1	2	5		

Tighten speed
Target:None
Apply

Control Pad

Disp
Load
Extensior
Tensile
Program

Speed
0.0100
(mm/s)
0.0200
(%/s)

Extension(mm/s)

0.01	0.02	0.05	0.1	0.2
0.5	1	2	5	

Tighten speed
Target:None
Apply

Wizard

Brief introduction

The left graph is a typical curve of metallic materials for tensile test (Force-Extension Curve). The whole control process includes 3 steps identified with the different colors in graph). The elastic range (green and red), the plastic range (blue) and fast separation range (black).

The first step  
Tighten speed :3mm/min  
Stress Speed10 MPa/s  
Switch to the second step after the force descend

The second step  
Strain Speed:.02 %/s  
Notice:Don't put down the extensometer!  
Switch to fast separation step when the elongation increment exceed2 mm

The fast separation step  
Speed:25mm/min  
and put down the extensometer

<< Previous (P)
>> Next (N)
Cancel (C)
Wizard (W)...

Control Pad

Disp
Load
Extensior
Tensile
Program

Speed
0.500
kN/s
5.00
MPa/s

Load kN/s

0.5	1	2	5	10
20	50	100	200	500

Tighten:5mm/min
Target:None
Apply

Control Pad

Disp
Load
Extensior
Tensile
Program

Program:
tidujiarai

Refresh
Goto Next Step (N)

<step 1>  
Displacement  
Control, speed:3mm/min, target:10mm;  
When load reaches 2 kN goto <step 2>

<step 2>  
Load Control, speed:.5kN/s, target:60kN;  
When keeping time reaches 10 s goto <step 3>

<step 3>  
Stress  
Control, speed:10MPa/s, target:100MPa;  
When displacement reaches 1 mm goto <step 4>

Edit (E)...

Through the Tensile Program Editor, user can setup test steps according to the requirements of standards.



☐ Video extensometer with RS232  
 Comm Port:  Settings:

☐ Use Doli Controller

☐ lbs, psi and inch

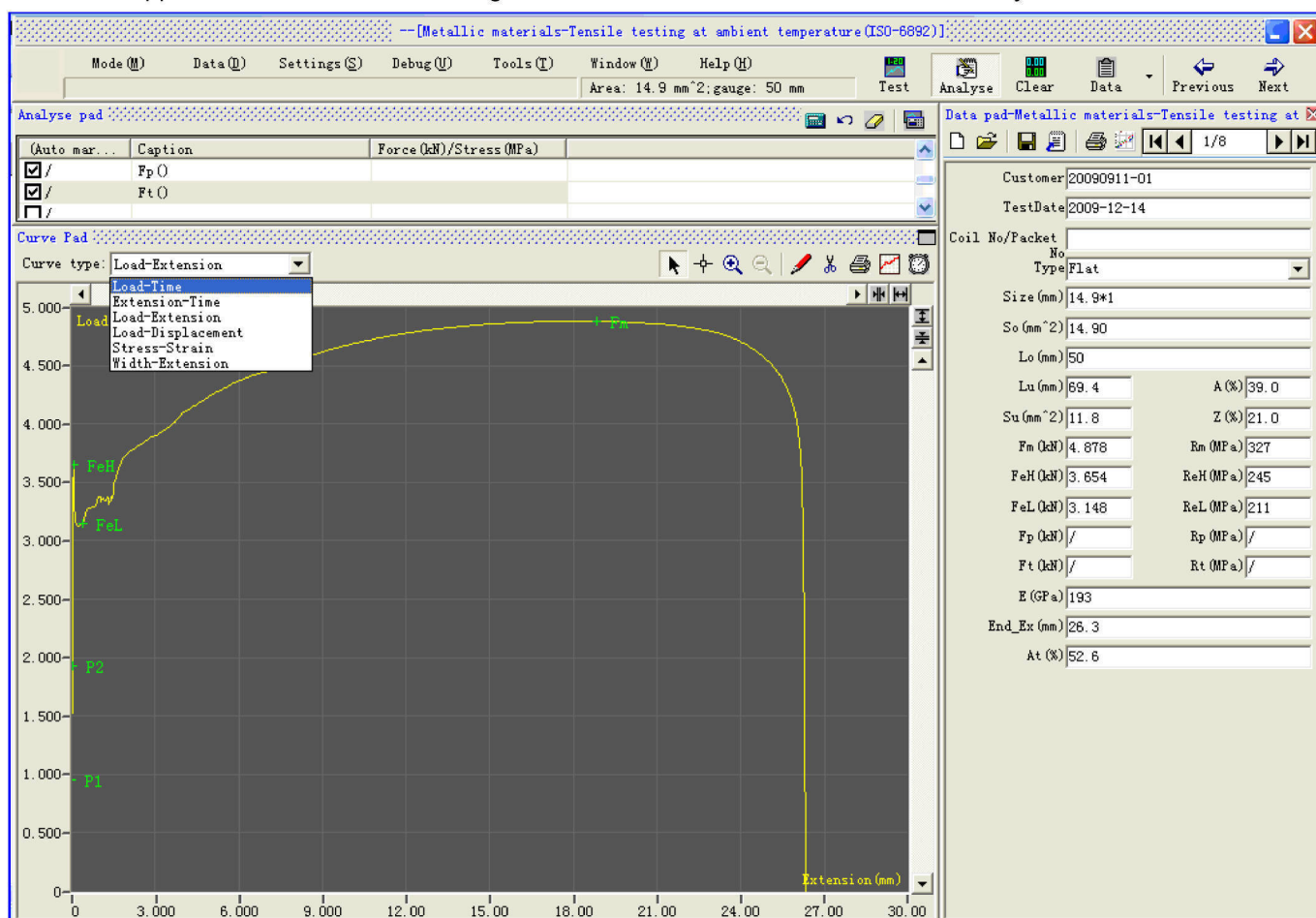
☐ Enable large extension    ☐ Equal to average value

☐ Double extensometer

☐ Speed display

Displacement decimal:

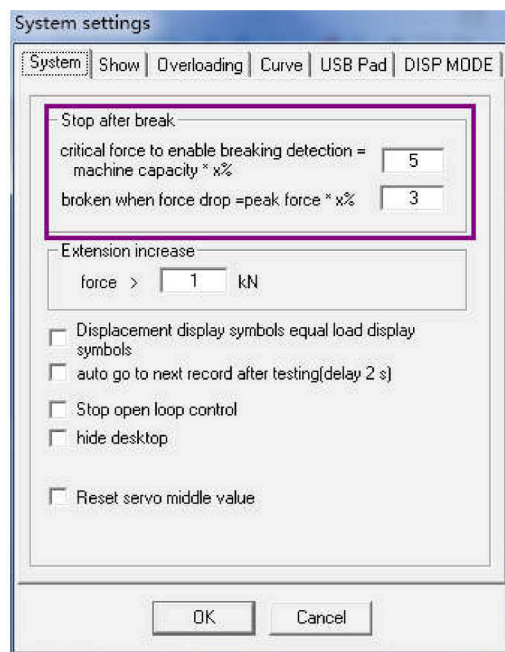
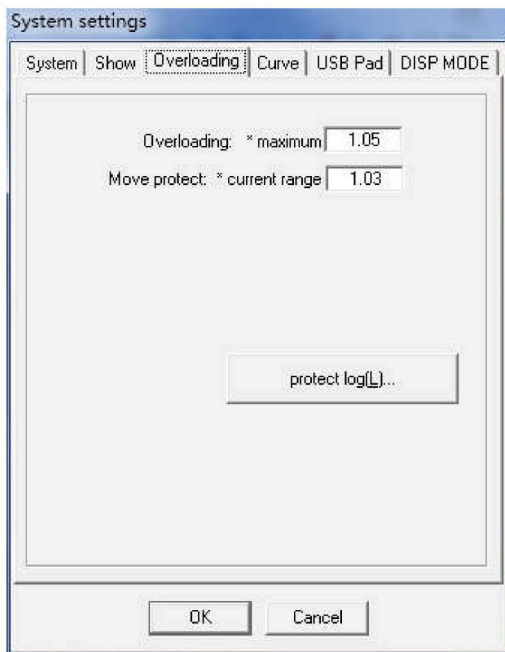
Software supports the functions to exchange the units between SI, Metric, US Customary etc.



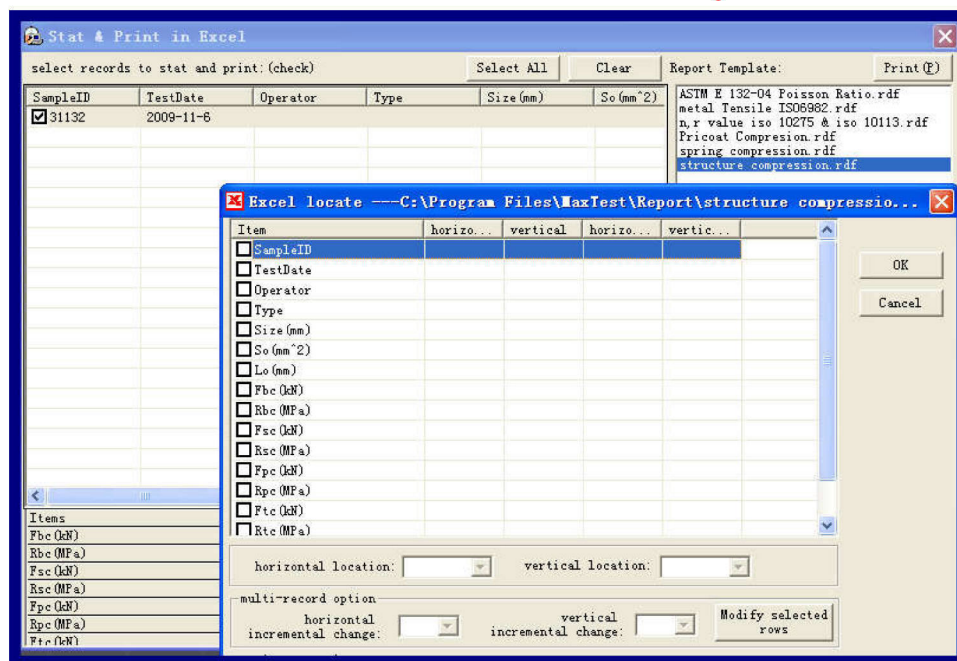
Multiple curves function in real time display including Load-Extension, Load-Displacement, Stress-Strain, Load-Time, Extension-Time, and Width-Extension.

Characteristic points such as Elastic Modulus, Yield points, Rp, Rm etc. can be marked on the curves, for a highlighted and visual observation.

Test result can be obtained automatically and also it can be got from the test curves manually.



Overload protection function & Break detection functions can be set through software



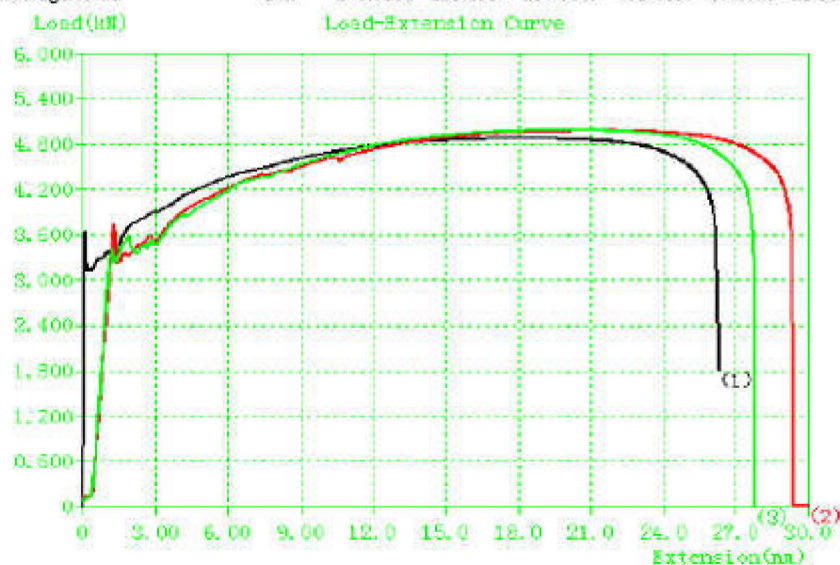
TE software contains all kinds of Report Templates. Customer can design various testing reports according to the requirements. Test result and curve can be converted to ASCII or spread sheet or Excel or the auto-creating report template.

**Metallic materials – Tensile testing at ambient temperature**  
**ISO 6892 : 1998**

TestDate	2009-9-11	Operator	LW
Temperature	20°C	Size(mm)	14.9*1
Lo(mm)	50	So(mm²)	14.9

PrintID	SampleID	Rm(MPa)	ReH(Mpa)	ReL(MPa)	Rp(MPa)	E(GPa)	A(%)	Z(%)
1	QD01	327	245	210	233	193	38	21
2	QD02	334	251	223	234	198	42	23
3	QD03	335	240	229	228	205	38	27
4								
Max value		335	251	229	234	205	42	27
Min value		327	240	210	228	193	38	21
Average value		332	245.3333	220.6667	231.6667	198.6667	39.6667	23.667



Print Date: 2009-12-8

**Select load sensor units**

Select

- ☒ 1kN
- ☐ 5kN
- ☐ 10kN
- ☐ 20kN
- ☐ 50kN
- ☐ 100kN
- ☐ 300kN
- ☐ 600kN

OK

Cancel

**select extensometer**

Select

- ☒ Range: 5mm Gauge: 10mm
- ☐ Range: 10mm Gauge: 25mm
- ☐ Range: 10mm Gauge: 30mm
- ☐ Range: 5mm Gauge: 50mm
- ☐ Range: 25mm Gauge: 100mm
- ☐ Range: 25mm Gauge: 200mm
- ☐ Range: 25mm Gauge: 500mm
- ☐ Range: 1000mm Gauge: 1000mm

OK

Cancel



Except the clip-on Extensometer, TE software supports Long Travel Extensometer, Full Automatic Extensometer, video Extensometer, laser Extensometer, and it can be added eight pieces of Extensometers & eight pieces of load cells at most.

DISP MODE	Extension (mm)-Extensometer	0.0
0.000		
DISP MODE	Large Extension (mm)	0.0
0.000		
DISP MODE	Extension-MFL (mm)	0.0
0.000		
Init MFL		
Upper position	50	Gauge (mm) 40
		Locate
Measurement begin		Clear
Measurement ends		